WHIRRAKEE

June 2000 Vol. 21 No. 5

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MONTHLY NEWSLETTER OF THE BENDIGO FIELD NATURALISTS CLUB

Bendigo Field Naturalists Club Inc.

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Membership of the Bendigo Field Naturalists Club is open to all those interested in Natural History. The subscription rates are: Single $30; Family $35; Concession: Single $25; Family $30. *Whirrakee* subscription only is $30.

General meetings are held on the second Wednesday of each month. The venue for General meetings is the Golden Square Senior Citizens Building, Old High Street, Golden Square. Meetings start at 7:30pm and conclude with supper. The Annual Meeting is held in September.

Committee meetings are held on the third Wednesday of each month at 7:30pm. Members of the Committee are the Office Bearers listed above, together with the following members:
J. Cleary, D Collier; W N Holsworth; M Lewis; K Lottkowitz; R Moors; S Pelczinski; M Stone.

Excursions The assembly point for excursions is the Golden Square Senior Citizens Building, unless otherwise specified. Full-day excursions normally commence at 10am (usually on a Sunday); half-day excursions normally commence at 2pm and may be either on a Saturday or Sunday. Full-day or half-day excursions are usually held on the weekend following the General Meeting. Campouts are held several times each year, usually coinciding with long weekends or holiday periods.

The Bendigo Field Naturalists Club has 2 active sub-groups:

Bird Observers Group: meets on the first Friday of the month, at 7:30pm. The venue for meetings is the Golden Square Senior Citizens Building.

President: Anne Bridley
Secretary: Jane Cleary

Mammal Study Group: meets on the fourth Wednesday of the month at 7:30pm in the Golden Square Senior Citizens Building.

Chairman: John Guley, 39 Cootamundra Place, Junortoun (5449 3479)
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Equipment Officer: Maurie Lewis (0407 427179)
Vice Chairman: John Burtonclay, Fadersons Lane, Mandurang (5439 5710)

Front Cover: Photographer: Ian Flecknoe-Brown
This juvenile White-faced Heron, *Ardea novahollandiae*, was wading at Kennington Reservoir last summer. Their habitat can vary widely: pasture dams, parklands, wetlands and even intertidal flats provide food and as a result they are extremely widespread in Australia. The white face is not developed till adulthood.

WHIRRAKEE

Monthly Newsletter of the Bendigo Field Naturalist Club

Vol. 21, No. 5, June 2000

Whirrakee takes its name from the Whirrakee Wattle (*Acacia williamsonii*) which is virtually endemic to the Bendigo region

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Authors are responsible for the accuracy of the information they use and also for any opinions expressed in their articles.
Contributions will be included as soon as possible after they are received, although articles received more than one week after the monthly General Meeting will probably be too late for inclusion in the next issue of *Whirrakee*.
Articles in *Whirrakee* may be reproduced, but permission should be obtained from the Bendigo Field Naturalists Club, and acknowledgment should be given to the author and the Club. Some back issues are still available on request.

Editors' Note
In this edition you will find the minutes of the May Club meeting. The committee has thought for a while now that it might be better to print the monthly minutes in the magazine rather than read them out at the start of each general meeting. We are obliged, by our constitution, to publicise these minutes somehow. Comments about this new format are welcome. After the May meeting, the question of excursions was discussed. Although we have not had an excursion for a while, the topic of the May meeting seemed to spark members' interest to go on a fungal foray once again (the last one was years ago). The next suitable date would be the 18th June but it may be too late then. The mushrooms have certainly been very impressive this month. If you are interested in such an excursion, please get in touch with Rod Orr closer to the date. His telephone number is on the inside of the front cover.

May General Meeting – Mushrooms and Fungi. Speaker: Robert Seviour

Author: Sabine Wilkens

This talk was mainly about sex. I was glad to see so many students there even though I was not sure whether they were all eighteen....

Fungi are classified according to their sexual reproductive behaviour.....if it is known. There are the Mastigomycotina which contain the water moulds. They have flagellate spores. This group contains the Chytridiomycetes, of which some members have been blamed for the recent frog decline in Australia. The Oomycetes or water moulds, traditionally also placed in this group, have thick-walled oospores resulting from sexual reproduction. These are possible not really fungi and rather belong to the protista, simple organisms that can be plant- or animal-like. Personally I will refuse to believe this. I have not spent six years of my life studying what I believed was a fungus (which is what I really wanted to do) only to find out it is not a fungus at all! A famous representative of the Oomycetes is *Phytophthora cinnamomi,* the cinnamon fungus, which is responsible for great destruction of native bush plants, particularly in Western Australia.
The slides, taken with a Scanning Electron Microscope by students of microbiology, were sensational and sensual, showing entwined male and female organs just before fertilisation.

The Zygomycotina which contain the pinmoulds, have non-motile spores and are not reliant on free water for reproduction. They also have a persistent structure formed by sexual union, called the zygospore, the formation of which was superbly shown by a series of slides of *Phycomyces blakeliana*. The zygospore of the species *Absidius spinosa* has what looks like a bird cage around it. I will endeavour to obtain a photo of this exquisite structure for a later edition of *Whirrakee.*

The Ascomycotina, as the name suggests have ascospores formed in structures called asci. This group includes the yeasts and cupfungi in which the asci are arranged on the inside of a cup-shaped macroscopic fruiting body. The orange peel fungus is a common representative in the bush.

The Basidiomycotina are the most well known, macroscopic mushrooms and toadstools. They have basidia which produce basidiospores between the gills or in the pores of the fruiting structure. *Agaricus bisporus* the commercial mushroom has two basidiospores per basidium but most members of this group have four spores attached at the very tips of the four-pronged basidium.
Amanita muscaria, the Fairy Mushroom and *Amanita phylloides*, Death Cap are both poisonous, although the latter is obviously more so. There are no general rules as to what features identify a mushroom as poisonous but never eating mushrooms with a cup-like membrane under the cap around the stalk is a good start.
The basidiomycetes also contain the beautifully coloured coral fungi, the jelly fungi, the shelf fungi, the birds nest fungi and the puffballs.

Those fungi which have been shy displaying their methods of sexual reproduction in public or those which may have genuinely lost their ability to reproduce sexually (although this would be hard to confirm) are grouped in the Deuteromycetes, a mixed collection of organisms, most of them probably not in the least bit related. Many species of *Penicillium* and *Aspergillus* are in this group

If diversity is a measure of success then the fungi have been very successful. It is estimated that there are 1.5 million species of fungi but in Australia, only 20 000 are 'known'.

Robert has made all the photographs presented on the night available to me and I have selected some for reproduction for this magazine. They will appear from time to time and might remind those that were there of this very interesting and entertaining evening.

At the end of the talk and the many questions that followed, Robert remarked how pleasant it was to talk to a largish audience and, more importantly, to a group that was vaguely interested what he had to say ... now there is a challenge for our students!

Mycophagy - or Fungus as Food

Author: Bill Holsworth

Fungi are the major food of most species of the sub-family Potoroinae (the rat kangaroos) and it is also an important item for many other native mammals, especially the rats. The most important types of fungi as food for mammals in Australia have hypogeal sporocarps (underground, like truffles) that form a mycorrhizal relationship with plants. Productivity of the ecosystem is improved three ways. The mammals have a reliable source of nutritious food. The spores of the fungi pass through the digestive system of the mammal and are distributed. The fungi enhance the growth of the plants (trees and shrubs, etc.) by passing nutrients and water to the plant.

All Potoroids, except *Hypsiprymnodon moschatus*, obtain most of their food by excavating pits in the soil. They are all omnivores and may eat some of the following: flowers, fruit seed, leaf stem, roots, tubers, bulbs, exudate, invertebrates, as well as fungi. *H. moschatus* is primarily a frugivore and studies to date have not shown them to eat a significant amount of fungi although they are well adapted to do so. Species from temperate habitats with predictable climates are largely mycophagous.

More than 50 species of fungi are found as spores in faecal pellets. The fungi are mostly hypogeal (underground) gasteromycetes that form ectotrophic mycorrhizal associations with forest shrubs and trees—usually with *Eucalyptus* species. The sporocarps (fruiting bodies) are 1-5 cm diameter and usually spherical. They occur in the topsoil or humus layer. The spores pass through the gut without being digested. Some epigeal (above ground) fungal are also eaten (Hymenomycetes (Boletoids), Ascomycetes, and Zygomycetes). Hypogeal sporocarps remain long after they mature and are therefore a reliable food source unaffected by droughts and fire.

The proportion of fungi in the diet is determined by examining faecal pellet material under a microscope and estimating the proportion of different types of plant cells and fungal spores. Although the non-digestible portion of the diet may be over emphasised in faecal pellet analysis, analysis of stomach content is substantially the same as in the scats.

Fungi are a good source of water, and in caloric terms, compare favourably with fruits and vegetables. Compared with nut kernels, fungi are a food source of protein, carbohydrates and minerals, but not of fats. The major constituents of fungal tissue are extremely variable among species and dependent on growing conditions. Although the proteins contain an excess of methionine, microbial fermentation of food in the sacculated fore-stomach allows *B. penicillata* to obtain a balanced diet. *P. tridactylus*, when fed a pure fungus diet maintained positive nitrogen balance.

A subject of scientific debate is the relative importance of fire and potoroos in determining the abundance of the most common fungal species. Fire stimulates the production of spores, but passing the spores through the gut of animals increases production of mycorrhiza and subsequently increases the growth rate of the seedlings. In addition, the faeces of the animal act to fertilise the soil and increase the growth of the seedlings.

The review by Claridge and May in the Australian Journal of Ecology, 19:251-275 is the most comprehensive synthesis of mycophagy by Australian mammals. I reviewed the more recent information at the Mammal Survey Group meeting in May and here I am providing a summary of the results of a few studies on the Potoroidae. A referenced paper can be obtained by e-mail at: wholsworth@bigpond.com.au.

The Potoroidae

• *Bettongia penicillata*, brush-tailed bettong

In a forested area in southwest WA the bettong diet is principally the sporocarps of hypogeous fungi. Gum exudates produced by trees and shrubs are also eaten. Fungi were the main source of protein. The inner 'kernel' of the sporocarp along with the spores contains 8 - 10% protein and 42% lipid. The protein is deficient in lysine (an amino acid) but very high in methionine, indicating a grossly imbalanced protein.

After bushfires *B. pennicillata* survives on hypogeous fungi and maintains weight. Tammar wallabies in the same habitat lose weight because their principal food source, grass, is gone. At Boyicup, WA, the fungus *Mesophellia* sp. is the

major food item.
B. penicillata on SA offshore islands eat primarily dicots. Fungi are not a major food item.

• *B. gaimardi*, Tasmanian bettong
These animals are the most dependent on hypogeal fungi of all Potoroids, but they also eat some seeds, roots and bulbs. Fungi are more abundant on poorer soils. Bettongs do not occur in areas of dense undergrowth. In areas of open undergrowth, the density of bettongs depends on the density of mycorrhizal fungi. Mycorrhizal fungi develop and sporulate well in soils of low fertility and so bettongs are most abundant on the infertile ironstone gravel soils and fine sandy soils. Mesophellia is the most frequent spore type in faecal pellets and the number of spore types is greatest in the dry season. Animals ate other food only when fungi were in short supply. Growth rates of pouch young are positively correlated to the amount of fungi in the mother's diet. Body condition of adults shows a similar, but weaker correlation.

• *B. tropica*, Northern bettong
This species is found only in a small area of dry open woodland forests of NE Queensland. At all three sites (wet, medium and dry) where animals were trapped, fungi were the major food. The rest of the diet was grass leaf and stem, roots and tuber, and lilies. Fungus consumption is greatest in the wet habitat and least in the driest site. The slight decline in fungal consumption during the dry season is offset by an increased proportion of grass in the diet. Breeding is continuous and aseasonal. Distribution may be limited by the lack of fungi in drier areas.

• *Potorous tridactylus,* Long-nosed potoroo
These animals dig shallow holes when seeking food, and the manus (forepaw) has a median claw that is long, strong and well adapted for digging. Microscopic examination of faecal pellets suggested that they are an omnivorous species but dependent on plant material for much of the year. Insects form 1-2% of the diet in winter but 21% in summer. In Tasmania the most important food in all months is fungi. (67% to 92%). *P. tridactylus* survives well after a bush fire utilising fungi as it main food source.

On the mainland, potoroos near Naringal Vic. had fungi as the main component in the diet with a maximum occurrence in faecal samples during autumn and winter (over 50%). Up to 77% of the diet in June is fungi, and although lower in summer it always exceeds 25%.

At Cabbage Tree Creek, Victoria and nearby in the Nadgee State Forest in south-eastern NSW, faecal pellet analysis showed the fungi are a major portion of the diet but seasonal differences were significant (higher proportion in wetter seasons). Sixty species of fungus were recorded and most were hypogeal or subhypogeal basidiomycetes. Some species were present throughout the year, others occurred only for a shot period.

• *P. longipes* Long-footed potoroo
This species is primarily mycophagous and fungi in the faecal samples exceeds 90% by volume and is never less than 80%. Most fungi are hypogeal or sub-hypogeal gasteromycetes but a few epigeal species have been recorded. Some vascular plants, seeds and insects are eaten. During the year the animals move to the habitats with available fungi. At Bellbird, Victoria spores in the faeces averaged over 90% fungal with no seasonal variation in the amount but with seasonal differences in the species present. *Mesophellia*, averaging 40% of all spores, is most common. On logged and unlogged sites fungi species were present in different proportions.

• *Aepyprymnus rufescens*, Rufous Bettong or Rufous Rat-kangaroo
In north-eastern NSW they eat introduced clover and grasses, but they were also eating over 30 species of epigeal fungi and hypogeal fungi associated with Casuarina roots.

• *Hypsiprymnodon moschatus*, Musky Rat-kangaroo
In north Queensland hypogeous fungi are a major food item, and the animals are frequently observed digging in the litter on the floor of the rainforest. The major portion of their diet, however, consists of fruit and seeds. Faecal pellet examination shows that litter fauna are eaten all year, and epigeal sporocarps of a few agaric fungi are also eaten.

Who Wants Exotics: A Brief History of Zoological and Botanical Gardens

Author: Bill Holsworth

Who wants exotics? It appears most of us do, and the civilisations that preceded us were also fond of exotic plants and animals. Zoos and gardens have a long history at least in the Middle East where a written history is available. Four thousand years ago, when the Egyptian Pharaohs and the kings of Mesopotamia created their empires, they also created menageries and botanical gardens.

The best preserved visual records are paintings 3,500 to 4,500 years old found the Egyptian tombs along the Nile River. In Mesoptamia the Assyrian palaces built 3,000 years ago are a rich source of carved images. In both areas written records on clay tablets and papyri describe the zoos and gardens made by the rulers for pleasure and prestige.

Expeditions to distant lands were made for the purpose of collecting animals and plants, and they employed handlers and gardeners to care for these unusual specimens with their peculiar requirements. The records reveal that the rulers were very proud of their menageries. For example, the female Pharaoh Hatshepsut obtained myrrh saplings from Ethiopia and started a plantation in Egypt. Myrrh was used for incense and mummification and was very expensive. She also collected baboons. Her successor, Tuthmosis III, had in his zoo some Indian birds that laid eggs daily - the first domestic chickens in Egypt.

During the 9th century B.C., a Mesopotamian king recorded, "I collected herds and brought forth their increase. From lands I travelled and hills I traversed, the trees and seeds I noticed and collected." Later, in the 6th to 4th centuries B.C., the Persian Empire included Egypt and Mesopotamia as provinces. The Assyrian king Sennacherib, at Nineveh, about 700 B.C., was interested in creating natural habitats for breeding foreign and indigenous animals. Texts record that, "the plantations were most successful; the herons which came from far away nested, and the pigs and others produced young in great number." The king also developed wonderful gardens. Recently an Oxford scholar concluded that the legendary Hanging Gardens of Babylon were the work of Sennacherib and not Nebuchadnezzer.

Persian leaders conceived a formal garden plan for their collections of foreign fauna and flora. The Persian garden was rectangular, enclosed by high walls, and was usually subdivided into four equal sections by canals radiating out from a central pool. These pleasure gardens were called *pairi-daeza* ("wall surrounded"), and in Greek "*paradeisos*". The ancient Egyptian and Mesopotamian garden evolved into the Eden of the Bible and the Koran, a reflection on earth of the Paradise of heaven.

Illustrations of these gardens from Egyptian tombs, the Mediterranean and Mesopotamia can be seen in the July 1999 issue of Scientific American. The picture essay by Karen P. Foster is also the source of the information presented here.

The Friends of the Botanical Gardens, PO Box 117, Bendigo 3550 are creating enthusiasm for the redesign and enlargement of the Botanical Gardens in Bendigo. Membership is $10.00. The next excursion on Sunday 2 July.

Use of Council Land between Crook Street and Gittens Drive, Strathdale
Report of a site visit on 1/2/00 by Anne Bridley, Jenny Hogan and Anthony Sheehan.

Author: Anne Bridley

The following birds were recording using the site between 10:40 and 11:45 am:
Spotted Pardalote were observed in willows, poplars and roadside trees. They nest in tunnels in low banks.
Yellow-rumped Thornbill were observed in willows.
White-plumed Honeyeater uses eucalypts, especially River Red Gums, and breed well in urban areas.
Willie Wagtail will nest on low branches overhanging water.
*** House Sparrow**
*** European Goldfinch**
Welcome Swallow are commonly seen hawking for insects over water and damp pasture. They will nest on buildings if a ledge is provided.
Silvereye feed on nectar, insects and soft fruit. They will nest in creepers and shrubbery close to buildings.

Other birds recorded near the site during the visit, all of which would probably use the site as it is:
Galah eats tubers of Onion Grass (*Romulea rosea*)
Eastern Rosella will use nest boxes
Red-rumped Parrot will use nest boxes
Red Wattlebird breeds in urban areas
Blue-faced Honeyeater breed in or near Strathdale Park
Magpie-lark breed in urban parks near water
Australian Magpie
Little Raven
***Common Starling**
***Common Myna**

Birds which may use the site as it is:
Australian White Ibis
Masked Lapwing
Crested Pigeon eats seeds.
Noisy Miner
Australian Raven

The following birds use Strathdale Park and may use the site with the proposed changes:
Australian Wood Duck camp near water. They will use a duck box to breed in.
Pacific Black Duck
Little Pied Cormorant
Collared Sparrowhawk
Purple Swamphen nest in reeds.
Musk Lorikeet comes to flowering eucalypts.
Grey Currawong
Clamorous Reed Warbler needs reed beds to breed in. They are present during summer in the reeds around the pond in Strathdale Park.

Other birds which use Bendigo's parks and gardens and which may use the site after the changes:

Australasian Grebe uses small dams with low fringing water vegetation. It makes its nest on small piles of vegetation.
White-faced Heron feeds in shallow water margins and grassland
Australian Hobby hunts small birds
Purple-crowned Lorikeet feeds on lerp and eucalypts flowers.
Horsefield's Bronze Cuckoo
Superb Fairy Wren needs a shrubby understorey for shelter, especially prickly ones like *Acacia genistifolia*, *Daviesia ulicifolia* and *Hakea decurrens* which may provide some protection against cats.
Striated Pardalote readily accepts nest boxes on the walls of buildings.
Weebill mostly takes insects from eucalypts.
Yellow Thornbill feeds in eucalypts, Silver and Black Wattle.
Little Friarbird uses River Red Gum.
Rufous Whistler nests in shrubs such as *Melaleuca decussata*

Grey Shrike-thrush
Grey Fantail
Black-faced Cuckoo-shrike

Species such as honeyeaters, weebills, thornbills, ibis (and others) contribute to tree and pasture health by eating insects. Pardalotes are specialist feeders on psyllids, which suck the sap of eucalypt leaves. They are therefore particularly important in combating dieback.

Possible Problems:

1. Noisy Miners aggressively exclude many small insect-eating birds, contributing to tree decline.. They are likely to be a problem. It has been estimated that strips of vegetation need to be 100 m wide or at least 10 ha in area to provide sufficient habitat for small bush birds if Noisy Miners are present. shrubs and saplings will help provide a hiding place.
2. Starlings and Common Myna will occupy nest boxes erected for parrots and will chase them away from hollows. Mynas even go so far as to kill young parrots in the box. Eggs or young of Starlings and Mynas can be removed from boxes if detected in time.
3. Silvereyes, parrots, grey currawongs and common mynas eat ripening fruit. They can be successfully excluded by bird netting which comes right to the ground. Bird netting which doesn't completely exclude birds is likely to trap and kill birds.
4. Foxes and cats may eat birds and predate nests. An island with trees, shrubbery and nest boxes will provide a safer place for nesting ducks, magpie-larks, superb fairy wrens, willie wagtails, yellow-rumped thornbills and other birds.

Editor's Note: Some of the material in this article is based on Anne Bridley's and other people's own observations, some on material in the 'Atlas of Australian Birds' and 'Atlas of Victorian Birds', and some on more recent research on Noisy Miners and the 'Birds on Farms' project run by Birds Australia.

Threatened Bird Network, Volunteer Activities
Regent Honeyeater and Swift Parrot Searches.

Weekends of May 27/28 and August 5/6
Contact: Simon Kennedy, phone 5430 4357.

Grey-crowned Babbler Tree Planting at Violet Town and Euroa in July - August
Contact: Birds Australia, phone 98822622

For other activities with threatened birds contact Birds Australia or consult the Club's copy of *Volunteer*, newsletter of the threatened bird network.

Bird-Atlassing Outings in the Bendigo Area: March – December 2000

Outings are on the first Sunday of each month. Most outings will be half day, but bringing some morning tea/lunch would be advisable. Meet at the Senior Citizens Centre, Old High Street Golden Square at 9am unless otherwise advised. Please contact Anne Bridley (ph. 54 494379) or Bev Culvenor (ph. 54 421983) if attending.

June 4–	Myers Creek between Sebastian and Raywood.
July 2–	Huntley area - Wellsford State Forest.
August 6–	Sedgwick State Forest/Swift Parrot Survey.
September 3–	Bullock Creek/East Loddon Area
October 1–	Loddon River/Serpentine Area.
November (date to to be confirmed)–	Tang Tang Wildlife Reserve.
December 3–	Marong State Forest.

From the Mailbag
Author: Elaine Mathison

Each month the club receives a number of newsletters and magazines: some by subscription and some in exchange for Whirrakee. These are available from the club library.

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THE VICTORIAN NATURALIST(VFNC)
Volume 117(2) April 2000

"Allelopathic Effects Of Sweet Pittosporum on Germination ...." reports on the effects of Pittosporum leaf-extract on the germination of selected native plant species.

- Allelopathy refers to any direct/indirect, harmful/beneficial, effect by one plant on another through the production of chemical compounds that are released into the environment.

"Orange Hawkweed: a New Naturalised Species in Alpine Australia" reveals that yet another exotic species has invaded mainland Australia. It has been planted at Falls Creek and potentially threatens subalpine communities.

"Plant Invasions in North-Eastern Victoria" outlines the problem of weed species arising from exotic garden plantings at ski resorts. Results of field surveys are presented.

"The Eastern Dwarf Tree Frog" is an inhabitant of wetlands and swamps along the east coast of Australia, from Jervis Bay south of Sydney, to the Atherton Tablelands in northern Queensland. The species has been discovered in a small wetland in suburban Melbourne; this is likely to be a recent introduction rather than a natural range extension.

"Birds and Boxthorn" reports on the various bird species seen using clumps of Boxthorn, both as a food-source and for shelter. Particular attention was paid to the behaviour of the birds feeding on this noxious weed introduced from South Africa in the 19th century.

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HABITAT(ACF)
April 2000

- Lethal waters: assault on our marine mammals
- Water torture: will the Snowy ever get a drink?
- What's up at Cape York?
- A conversation with David Suzuki
- Woodlands up in smoke

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FIELD NATS NEWS(FNCV)
May 2000

- The story of Broken Hill and its mineral wealth
- Fossil-collecting in the Geelong area
- Yellow-footed Antechinus

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CANOPY(Parks Victoria)

- Alpine bogs protected
- Colonies thrive on remote island
- Woodlands Historic Park: a remnant grassy woodland

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Also received recently:

*Castlemaine Naturalist(CFNC) May 2000

*Geelong Naturalist(GFNC) May 2000

*Newsletter(Ballarat FNC) May 2000

*Environment Victoria News May 2000

*Australian Landcare March 2000

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Bendigo Field Naturalists Minutes of the General Meeting 10th of May, 2000

Open: 7:45pm.
Present: 43

Minutes of the 12th of April General Meeting were read. A correction was made to the date of the Garden Working Bee from 10th May to Sunday 21st of May. The minutes were then accepted, mov. Lyn Hamilton, sec. Maurie Lewis.

Nominations: Bec Mifsad and Peter Adams were accepted by the Committee and welcomed at the meeting. The usual procedure which is to have the nominations considered at the general meeting and then confirmed by the Committee was then discussed.

Correspondence: Anne was not well and there was no correspondence. Usually Anne deals with the correspondence and items which have to be brought to the notice of the meeting are discussed)

Guest Speaker: Dr Robert Seviour, Division of Biological Sciences, La Trobe University, Bendigo. Dr Seviour was kind enough to change the time of his lecture at a very short notice (the Club thanked him for this).
Dr Seviour spoke about fungi and mushrooms and showed us slides illustrating their forms of reproduction. The lecture was very informative and interesting (for details see page 3)

General Business: Nil

Reports:

1. **Friends of the Botanic Gardens** – there was going to be a more comprehensive press release on Friends of the Botanic Gardens. Glenise Anthony, the President of the Friends of the Botanic Gardens, will organise a talk at the Gallery followed by a walk to Rosalind Park. The walk will finish at the Gallery where Glenise will show paintings that are usually not displayed on the walls of the Gallery but can be accessed on special occasions. The paintings depict Bendigo's early history. Jan Orr reported that the walk will be on the 21st of May 2000. The walk has to be booked at the Gallery because the numbers are limited to 50 people only. A walk between Lake Weeroona and White Hills Botanic Gardens is planned for later in the year. Jane Cleary knows a lot about the history of the White Hills Botanic Gardens and its physical connection to Rosalind Park.

2. **Former Military Reserve in Longlea**
the proposal of a driving school at the former military reserve at Longlea has been raised. Rod reported that the issue has to wait until after the EEC drafts its recommendations when the Club will have the opportunity to comment.

3. **Excursions** – Rod suggested that we book a 22-seater bus for an excursion about fungi on Sunday 18th June.

4. **Frogmouth Owl** – Diana Floyd reported seeing 2 frogmouth owls in the One Tree Hill Park

5. **Spotted Quail** – Maurie Lewis reported seeing a spotted quail in the bush.

6. **Foxes** – Rob Moors reported seeing a lot of dead foxes on the roads.

7. **Garden Working Bee** – Barbara Chmielewska announced that there will be a Garden Working Bee on Sunday 21st May starting at 9am.

Meeting closed at 9:30pm.

WOODLAND PROTECTION AND FIREWOOD. KEEPING BOTH.

National Conference
La Trobe University, Bendigo, June 8 and 9

This conference is for environmentalists and community organisations,professional and hobby farmers, agroforestry experts, the industrial firewood and home heating industries, governments, catchment management authorities and environment professionals....and YOU!

As you would know, up to 1.5 million tonnes of firewood is consumed each year and most of this comes from our endangered woodlands: the quintessential Australian forest and the honeypot for our wintering birds. Our woodlands can't survive this treatment; we've already lost 85% of the Box Ironbark.

There is a solution. It's already underway, but needs to happen much faster: grow the firewood on already cleared farmland. It gives the farmer a cash crop, reduces salinity and soil loss, and can provide healthy habitat if done well.

The conference will foster discussion around these problems, and the solutions, including the VNPA's Firewood Business Plan and practical examples of plantation firewood from NSW, Victoria, and the ACT. An afternoon field trip and conference dinner are included.

Further information will be available in March. If you can volunteer some time, have some ideas, suggest some places to advertise or just want to register interest contact Karen Alexander (tel/fax 03 59684651 or Jason Doyle (VNPA, tel 03 96508296, fax 96546843).
There will be a cost but good concessions will be available for voluntary community organisations.

Environments in Distress

from *La Trobe Bulletin* May 2000
Author: Rhonda Dredge

Stress during the early development of complex organisms increases the likelihood that certain characteristics – such as the teeth of humans, the leaves on plants, the bristles on insects – may differ between the left and right sides of the individual.

According to an intriguing biological law, the 'asymmetry of bilateral traits', babies born to alcoholic mothers are more likely to have dental asymmetry, for example. Aquatic insects subjected to heat or chemical stresses such as heavy metals may have different left and right wings.
'Is this a useful early indicator of organisms in trouble?' asks La Trobe biologist Professor Ary Hoffman. 'Can we look at changes at the level of the individual organism to give an early warning of environmental stress?'

Professor Hoffman is the director of the Centre for Environmental Stress and Adaptation Research, a new Special Research Centre, announced in the latest round of ARC funding.

The Federal Government and associated agencies will provide $12.6 million over nine years to fund the centre which will be staffed by fifty-two researchers and post-graduate students.

The Centre combines expertise from research groups based at the University of Melbourne and Monash, as well as La Trobe, to look at stress in the environment and ways of measuring its impact. It is the only special research centre in the area of environmental science.

'Our habitats', Professor Hoffman says 'are becoming increasingly exposed to stressful inputs, ranging from exposure to noxious industrial and agricultural chemicals to the increasing effects of global warming'.

'There is no such thing as a pristine environment any more. All environments are stressed to some extent. This Centre aims to understand the adaptive processes of organisms of organisms to these stresses.'

The Centre will tackle three main research programs: chemical stress adaptation (including genetically modified organisms), climatic stress adaptation and biomonitoring.

The focus will be on invertebrates – aquatic and terrestrial – because they have genetic adaptations that have been well-studied and provide model-systems applicable to mammals. They are also significant as pests and vectors for micro-organisms that carry disease, and study of their adaptations will help scientists understand the development of resistance to pesticides.

Professor Hoffman has researched the impact of environmental stress on evolutionary change for many years. His group was the first to show experimentally that application of a particular stress resulted in trait-specific changes in asymmetries in the fruit fly *Drosophila*.

Those flies exposed to the combined chemical cold nutrition stress grew an average of two more bristles on one side of their heads.

He says that an organism needs energy and resources for normal functioning. If there is stress, resource are directed to counter its effect. If this occurs at the critical point for bristle growth, normal development will be affected.

While bilateral symmetry may seem to be a bizarre finding, it could have major implications for biomonitoring.

'The problem with current environmental monitoring is that it is based on biodiversity. By the time you pick up the effects, several species have already been lost,' Professor Hoffman says.

Currently, for example, salinity in soils is noted when an area is colonised by salt bush. By this time it is too late to prevent the problem. Heavy metals may be easy to detect, but at what levels should the warning bells go off?

Professor Hoffman hope the research into fluctuating asymmetry will provide more sensitive measures of environmental stress.

One research project will look at the traits of an aquatic midge as a measure of heavy metal pollution in urban Melbourne wetlands. Another will investigate the bilateral symmetry of grasses in response to salinity ad soil acidification.

The Centre will combine pure and applied research and disseminate its findings to industry and environmental groups. Earth Watch, Melbourne Water, Novartis and Agriculture Victoria are already interacting closely with the Centre.

Bendigo Field Naturalists Club Inc.

Speaker Syllabus for General Meetings – Second Wednesday 7:30 pm

Date – 2000	Topic	Speaker
2 June	**Special Speaker for World Environment Day**	**Ern Perkins OAM** Field Naturalist Extraordinaire, see p 8
14 June	**Environmental Law**	**Barry Phillips** School of Management, Technology and Environment, LaTrobe University, Bendigo, P.O. Box 199, Bendigo 3552
12 July	**Hollow Formation in Box-Ironbark forests**	**Les Vearing** Forester in Charge, Bendigo Forest Management Area, Dept of Natural Resources and Environment, Box 3100, Bendigo Mail Centre 3554
9 August	**Fallen Timber and Fauna Habitat**	**Lawrie Conole** 3 Gezireh Street, Pascoe Vale South Victoria 3044
13 September	**President's Address at Annual General Meeting**	**Rodney Orr**
11 October	**Soils of Bendigo**	**Nathalie Baxter** Land Evaluation Officer Centre foe Land Protection P.O. Box 3100, Bendigo Mail Centre. 3554
8 November		To be announced
13 December	**Christmas Dinner**	No speaker this month

Diary

The General, Bird Observers Group and Mammal Survey Group meetings are held at the Golden Square Senior Citizens Building, Old High Street, Golden Square, unless otherwise indicated.

General Meeting

Wednesday, June 14, 7:30
Barry Phillips (School of Management, Technology and Environment, La Trobe University, Bendigo) will be talking about 'Environmental Law'.

Wednesday, July 12, 7:30
Les Vearing (Forester-in-charge, Bendigo Forest Management Area, DNRE) will talk about 'Hollow Formation in Box-Ironbark Forests'

Excursion

There might be an excursion to Bullarto on **Sunday June 18** to look for fungi but this will depend how many fungi are still left to look at. Please contact Rod Orr (54435668) closer to that date if you interested.

Bird Observers Group

June 4 – Myers Creek between Sebastian and Raywood.
July 2– Huntley area - Wellsford State Forest.

Atlassing Excursions are conducted on the first Sunday of every month. See page 9 for the year's program.
Meet 9am at the Clubroom, this is a half-day excursion.
Please contact Anne Bridley (ph. 54 493479) or Bev Culvenor (ph. 54 421983) if attending.

Mammal Study Group

The next regular monthly discussion evening is on **Wednesday June 28**

Topic: Recent studies on the Echidna
AND: Response to the Environmental Conservation Council Report on the Box-Ironbark Forest Study Area.

Garden Working Bee

The next Garden Working Bees will be held on

Sunday 25th June, 9am.
All welcome and encouraged to attend.

Supper

The usual arrangements for supper are as follows: members either bring a plate or pay $1 for supper. This small amount is used to reimburse members who purchase essential supper supplies.

Other Events

Woodland Protection and Firewood. Keeping Both
June 8 and 9, La Trobe University, Bendigo
see page 11 for details.

The **Friends of the Botanical Gardens** are creating enthusiasm for the redesign and enlargement of the Botanic Gardens in Bendigo. The next excursion is on **Sunday 2 July** (see page 6 for more information)

Wildlife Rescue & Information Network Inc.

W.R.I.N. is an organisation dedicated to the care of orphaned, sick or injured native animals.
It is fully endorsed by the Dept of Natural Resources and Environment.
Please call our Emergency Number for Help for Fauna in Need. Phone: 0419 356433.